National Cable Television Association | State Telecommunications Policy | 1724 Massachusetts Avenue, Northwest
Washington, D.C. 20036-1969
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February 20, 1997

EX PARTE

William F. Caton, Acting Secretary
Federal Communications Commission
1919 M Street, N.W.- Rm. 222
Washington, D.C. 20554

Re: CS Docket No. 96-45

Dear Mr. Caton:

On February 6 & 7, 1997, representatives of the National Cable Television Association (NCTA), Jones Intercable, the Medical College of Georgia and Georgia Institute of Technology met in Augusta, Georgia with John Clark of the Universal Service Branch of the Common Carrier Bureau of the FCC and Deonne Bruning of the Nebraska PSC and Federal-State Joint Board Staff. The purpose of the meeting was to discuss rural health care providers, telemedicine, the telemedicine programs currently in place in Georgia, and the requirements of the Telecommunications Act of 1996. A live demonstration of the Georgia Statewide Telemedicine Program and the Electronic Housecalls program took place.

You will find attached a copy of the handouts that were distributed to the Joint Board staff members. At the meeting NCTA informed the staff members that it is NCTA's position that just as the Joint Board has recommended that providers other than telecommunications carriers may offer access to advanced and information services to schools and libraries under Sec 254(h)(2)(a) of the Act, providers other than telecommunications carriers should be deemed eligible to provide access to advanced and information services to health care providers. If you have any questions concerning this matter, please contact the undersigned.

Sincerely,

Richard L. Cimerman

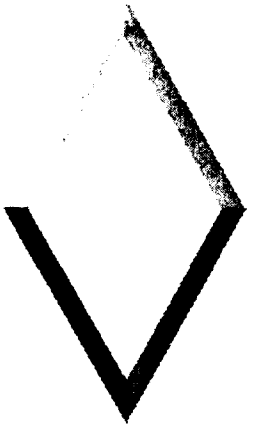
Richard L. Cimerman

cc w/o attachment: John Clark
Deonne Bruning

EHC

Electronic House Call

THE ELECTRONIC HOUSECALL



Electronic House Call

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8/23/96

THE ELECTRONIC HOUSE CALL

A Telemedical Approach for Delivering Medical Care to Patients in Their Homes and in Nursing Homes

BACKGROUND

The necessity for containing costs at the federal level is manifesting itself across all societal programs, but its impact is especially pronounced in the healthcare industry. As a result, the U.S. healthcare industry is undergoing fundamental changes characterized by innovative service delivery approaches that require new measures on the part of individuals, communities, care providers, and the entire healthcare industry. These changes are expected to translate into radically new organizational structures that emphasize primary, community, preventive, and outpatient care rather than the conventional inpatient care available in hospitals.

INTRODUCTION

A fundamental factor influencing the development of new approaches to healthcare delivery is advanced technology. In fact, new technologies in areas such as computers, telecommunications, biosensors, electronic networks, etc. are emerging at an extremely rapid rate. They are also converging in ways that offer significant potential benefits to the healthcare industry. An excellent example of this is the now-possible use of computer-based telemedicine systems for delivering healthcare directly to patients in their homes and in nursing homes. These systems, linked to a central monitoring station staffed by medical care providers, make possible the diagnosis of a wide range of illnesses and the delivery of wellness information without requiring patients to leave their homes. When integrated with educational and entertainment systems, these telemedicine systems will provide a multi-functional home electronic system whose two-way audio, video, and data capabilities meet a variety of social and medical needs for tomorrow's citizens.

PROJECT DESCRIPTION

The Army's Medical Advanced Technology Management Office at Ft. Detrick, MD recently funded a project at the Medical College of Georgia (MCG) and the Georgia Institute of Technology (GIT) to develop, install, and evaluate telemedicine systems that use cable television coaxial connectivity to deliver medical care to patients in their homes and in nursing homes. This "proof-of-concept" effort, referred to as the Electronic House Call Project and undertaken in collaboration with the Eisenhower Army Medical Center (EAMC), involves the installation of computer-based telemedicine systems in the homes of 25 chronically-ill civilian and military patients, in one skilled nursing home, in two medical centers, and in the home of one civilian medical doctor. The coaxial connectivity is provided by Jones Intercable, Inc. The home-based system uses four major interfaces to provide data and interactive audio/video conferencing between residential areas and the central monitoring systems at MCG and EAMC. One interface controls (initiates the measurement sequence, acquires the resulting data) an array of home-based, user-friendly diagnostic devices capable of monitoring temperature, weight, oximetry, blood

pressure, cardiac rate, cardiac and lung sounds, and cardiac rhythm. A second interface provides a series of attractive, multi-media screens by which patients interact with the system via the computer's touch screen monitor. These screens provide written, verbal, and video instructions for using the diagnostic devices associated with the system. These screens also provide information on specific illnesses and health maintenance guidelines. The third interface provides access to a compact disk player that patients can use to access a wide range of commercially-available medical information. In the later version of the system, this interface will also provide access to an even wider range of medical information available on the World Wide Web. The fourth interface is the connection to the bi-directional coaxial cable that links patient's homes and the nursing home to the medical centers. The central monitoring system is a computer-based telemedicine unit that accepts and processes input data from the patient homes and the nursing home. Data are analyzed in a manner that permits trends indicating patient medical status to be identified in real time. Coding permits automatic entry of data into the appropriate patient's medical records. Call queuing is available, and an emergency interrupt capability accommodates patients with a need for immediate medical assistance. If the data received from the home-bound patient is routine, the person staffing the monitoring system notes the patient's medical status and forwards the data for recording. However, if non-routine data are received, the staff person initiates a video teleconference with the patient. During this teleconference, the reason for the non-routine data is established and appropriate guidance is provided to the patient. If the situation warrants, the staff person can add a medical doctor to the teleconference and thereby obtain further medical opinion regarding appropriate responses to the patient's medical condition.

For further information, contact:

Dr. Max Stachura
MCG
706-721-6616

July 8, 1996

TELEMEDICINE ADVANCES IN GEORGIA

The health care industry is undergoing fundamental changes in response to the need to control spiraling medical costs. A principal feature of these changes is the development of innovative service delivery approaches that can control costs while maintaining or improving patient access to high quality medical care. Many of the new approaches emphasize the enhancement of traditional primary, community, preventive, and outpatient care as opposed to conventional inpatient care in hospitals. At the same time, rapidly evolving electronic, computer, and communications technologies provide valuable tools for supporting new care delivery approaches. During the GCATT Open House, demonstrations will be provided to illustrate how Georgia is expanding its leadership role in telemedicine through the Georgia Statewide Telemedicine Program and research on an Electronic House Call system.

The Medical College of Georgia established the first state telemedicine network in November 1991. In 1992, the Medical College of Georgia was asked by the State of Georgia to develop, implement and manage the Georgia Statewide Telemedicine Program (GSTP) as a component of the Georgia Statewide Academic and Medical System (GSAMS). Today, the GSTP links hospitals, outpatient clinics, community and public health centers and correctional facilities. Four of the correctional facilities are served by a mobile telemedicine van designed by the Department of Administrative Services and the Medical College of Georgia. Over 800 consultations have been conducted to date. Forty-two of the 62 planned sites are fully operational, with network completion expected by 1997. The mobile telemedicine van will be connected with a military tertiary medical center during the Olympics to deliver health care to military beneficiaries working with the Olympics.

The Medical College of Georgia, the Georgia Institute of Technology, and the Eisenhower Army Medical Center are collaborating to develop and evaluate a "proof-of-concept" system to deliver medical care to patients in their homes. This project, the Electronic House Call, is installing computer-based monitoring stations in the homes of 25 volunteer patients and in one skilled nursing home in the Augusta, Georgia area. The units are linked to central monitoring stations at the Medical College of Georgia and the Eisenhower Army Medical Center via bi-directional cable made available by Jones InterCable. Interactive audio/video conferencing between patient systems and the central monitoring station include equipment to assess a variety of patient physiologic parameters including heart and lung sounds, blood oxygen concentration, cardiac rate and rhythm, blood pressure, body weight, and temperature. The central idea is that better communication links enable the monitoring of a broader range of patient measurements from home. This will in turn promote the patient's medical stability and reduce the need to access high cost in-patient and emergency resources. The system is designed to provide a wide range of capabilities and yet remain simple enough for a non-technical patient to use by themselves. Thus, the patient selects options by pointing at icons on a touch sensitive screen, and she or he receives on-line video instructions whenever help is requested. The entire focus is on bringing medical care into the patient's home without the need to send a care provider. Major funding for this research comes from The Georgia Research Alliance, the Army Medical Research and Development Command, and the Medical College of Georgia, with in-kind contributions from Jones InterCable, Inc.

FOR MORE INFORMATION:

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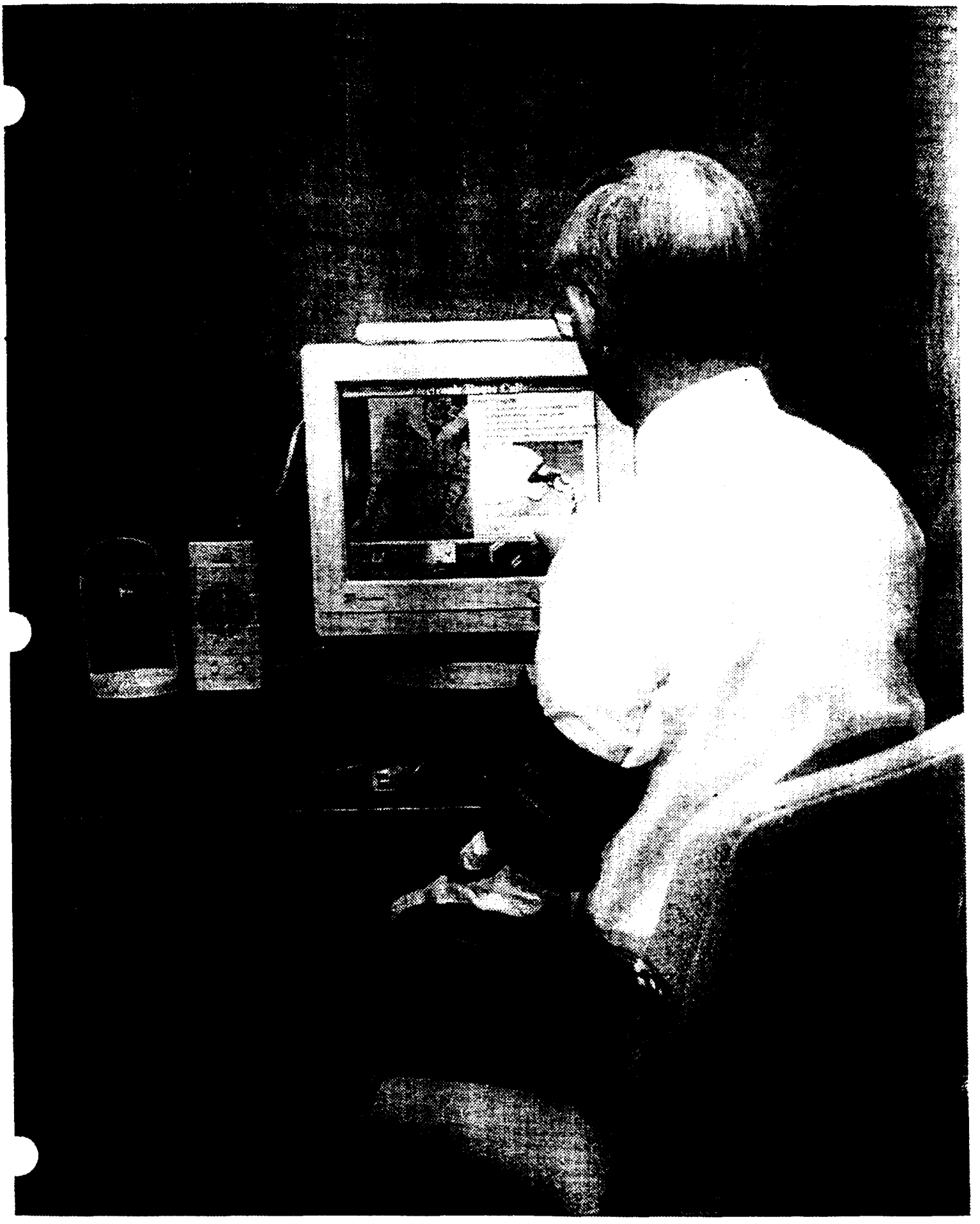
Georgia Institute of Technology
Biomedical Interactive Technology Center 404-894-3964

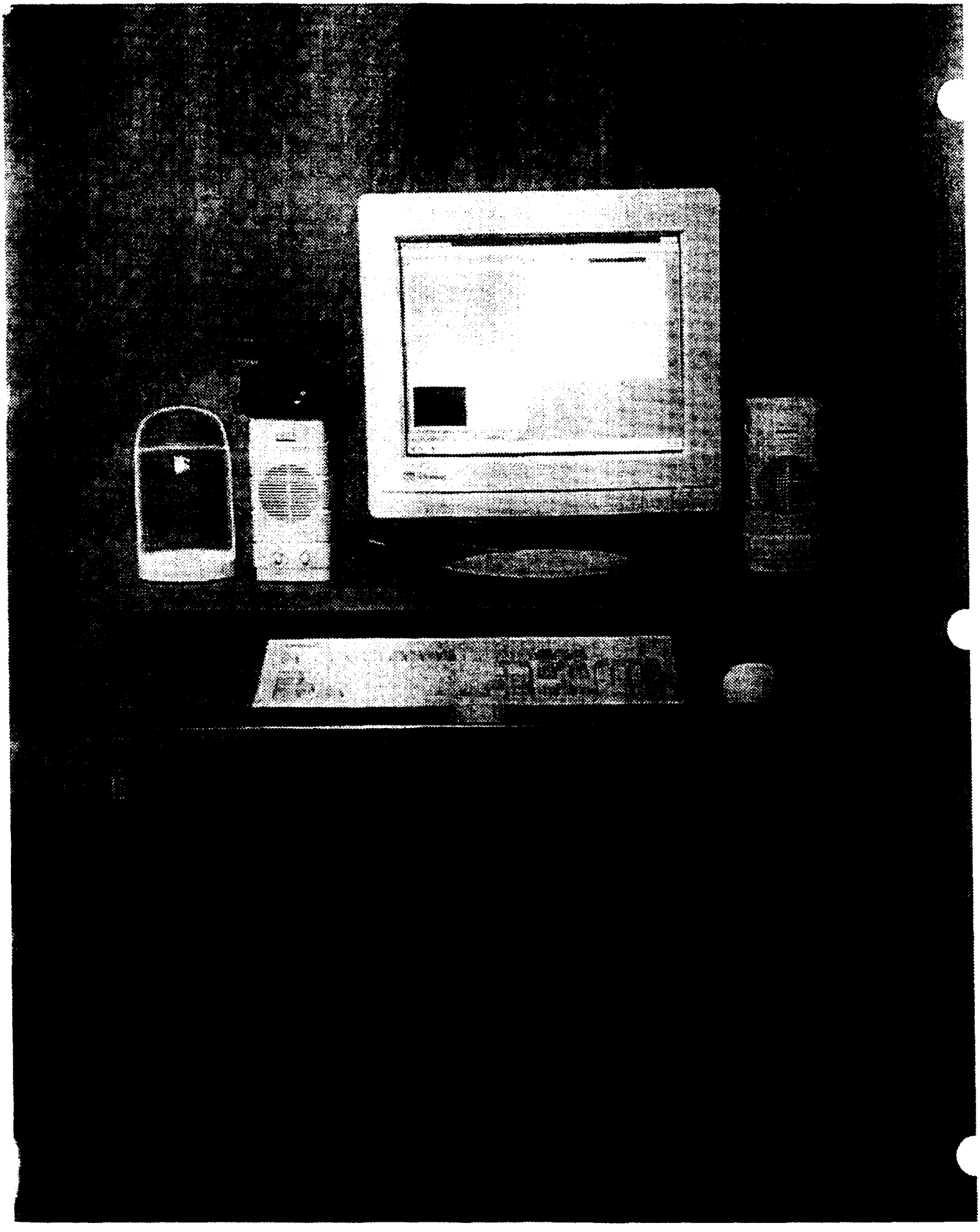
THE MEDICAL COLLEGE OF GEORGIA

HOUSE CALLS REVISITED

MCG President Francis J. Tedesco discusses MCG's work bringing health care to chronically ill patients' homes via interactive electronic technology during a Dec. 18 press conference unveiling the electronic house call to the public.

WEDNESDAY, JANUARY 29, 1997





Atlanta Journal and Constitution 1/4/1997

A new kind of house call

yber docs: Rapid advances
ı telemedicine are bringing
hysicians into the homes of
ıronically ill patients.

ly Anne Rochell
TAFF WRITER

House calls, once a thing of the past, could be the wave of the future.

A trip to the doctor through cyberpace is not as far off as it sounds: A rototype of the "electronic house all" has been developed by the Medial College of Georgia, the Georgia nstitute of Technology and the Army. he two-way video-conferencing sys-em allows not only for live, audiovisu-l, patient-clinician consultation but lso for the transmission of data from variety of medical devices.

"Doctors having physical contact ıth individuals is very important for ertain diagnoses, but not all," said fichael Burrow, a senior research ngineer at Georgia Tech 'ho helped develop the ystem. "There are many onditions that can be iagnosed and treated sing a telecommuni-ations system."

The system is the test step in telemedi-ne, a field pioneered by ıe Medical College of Georgia. The ugusta school manages a 40-site ate telemedicine network that links ommunity health centers to experts MCG, saving rural residents a trip the city when they need to see a ecialist.

With the electronic house call, ıronically ill or elderly patients not ly can remain in their communities ıd still get good care — they can stay home.

Mary Culver, 69, of Augusta, esn't need any more convincing.

"They can't have that machine ick!" said Culver, who lists among r chronic ailments diabetes, sleep nea and being "fat and sassy."

"It's like having your own physician ing in," she added.

Culver is one of 25 Georgians in a lot study of the system. It is also being tested at a 100-bed nursing home in Augusta, with computer links to a physician's office and home.

From her living room, Culver calls a nurse by touching the icon of a telephone on a computer screen. With video cameras, a two-way cable hookup, speakers and several medical instruments, Culver can relay information ranging from a simple, oral "I don't feel well" to a more complicated blood-oxygen measurement or an electrocardiogram readout.

Devices such as a stethoscope, a blood pressure cuff and a thermometer are hooked to the computer and send information directly to the clinician at the other end.

"My day is shot when I have to go to the doctor," she said. "This saves me from having to dress, walk all over the place and look for a parking place. And it's so good in an emergency. If I have a high fever or something, I don't always have to rush immediately to the hospital."

The system was created to serve people like Culver — nicknamed "frequent fliers" — who have chronic diseases and require frequent care, said Dr. Max Stachura, clinical director of the MCG Telemedicine Center.

"There are a large number of individuals who have chronic medical conditions who have to incorporate the management of that condition into their daily living," Stachura said. "The patients who have those kinds of conditions actually take care of themselves on a day-in, day-out basis. The clinician is really functioning as a coach, as someone who explains how to deal with that condition. This is ideal for that."

The hope is that this system will reduce hospital admissions for the chronically ill by making it convenient for them to seek help before a problem becomes acute, Stachura said. It could even delay an older person's needing to seek institutional care, he said.

"When a person continually has to go to the hospital, it doesn't take very long before someone decides they need to be in a nursing home," he said. "This system can act as surveillance of the patient's medicines and their well-being."

The system, developed and tested with $2 million in funding from the Georgia Research Alliance and the Army, is made from existing computer hardware and costs about $15,000. But its creators will try to reduce costs by $5,000 by developing original parts and using people's televisions instead of a computer monitor. After that, they'll begin marketing the system.

"That's still not cheap," Stachura admitted. "We need to do more studies to answer questions for the insurance companies like, is it cost-effective? How many emergency room visits do you have to prevent before you offset the cost? How many months do you delay entry into a nursing home before you offset the cost?"

The system runs through cable lines that have been retooled to run messages two ways instead of one, as they do when delivering TV programs to homes. The researchers chose cable instead of phone lines because cable can transmit more information faster, Burrow said.

Also, many other computer transactions, such as at-home banking and education, probably will run through cable lines in the future, so using cable made good business sense, he said.

"I think everyone in the future will have a system in their home which is an entertainment system, access to banking and the Internet," he said. "And health care will be a component.

"I look forward to calling a doctor from home when I think I have a sinus infection, having him look down my ears and down my throat and make a diagnosis and then getting my prescription delivered after ordering it over the Internet. Why can't that be done?"

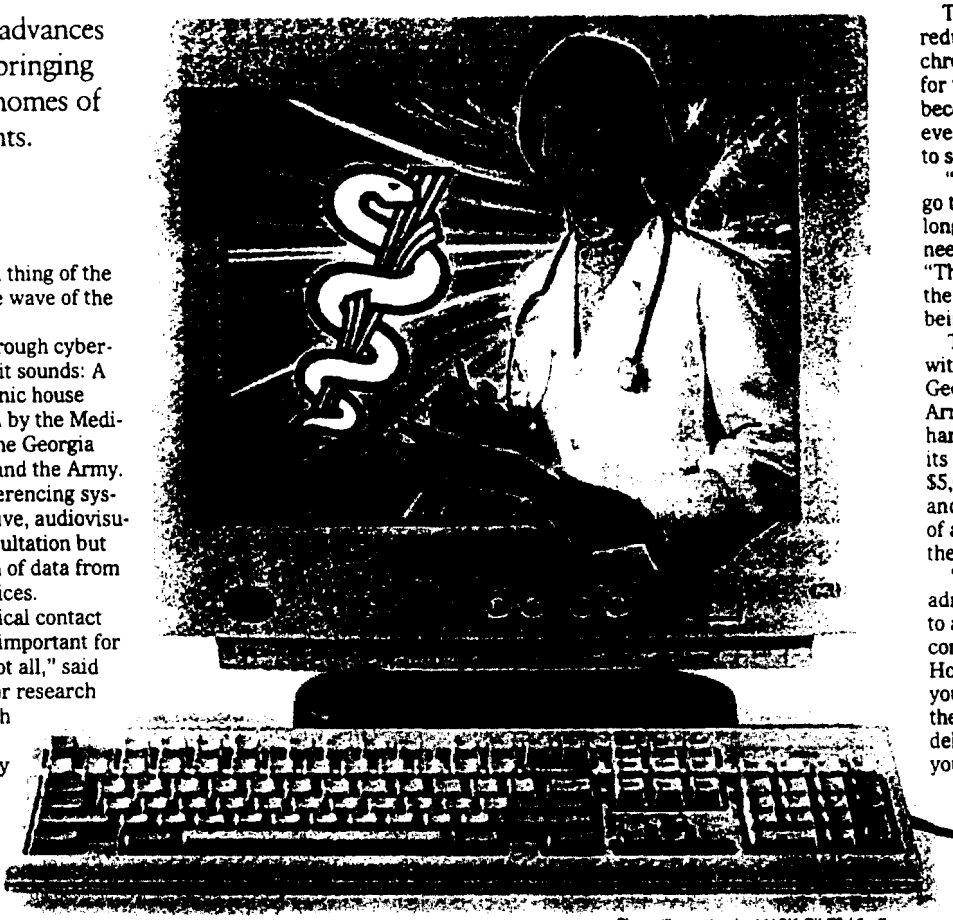
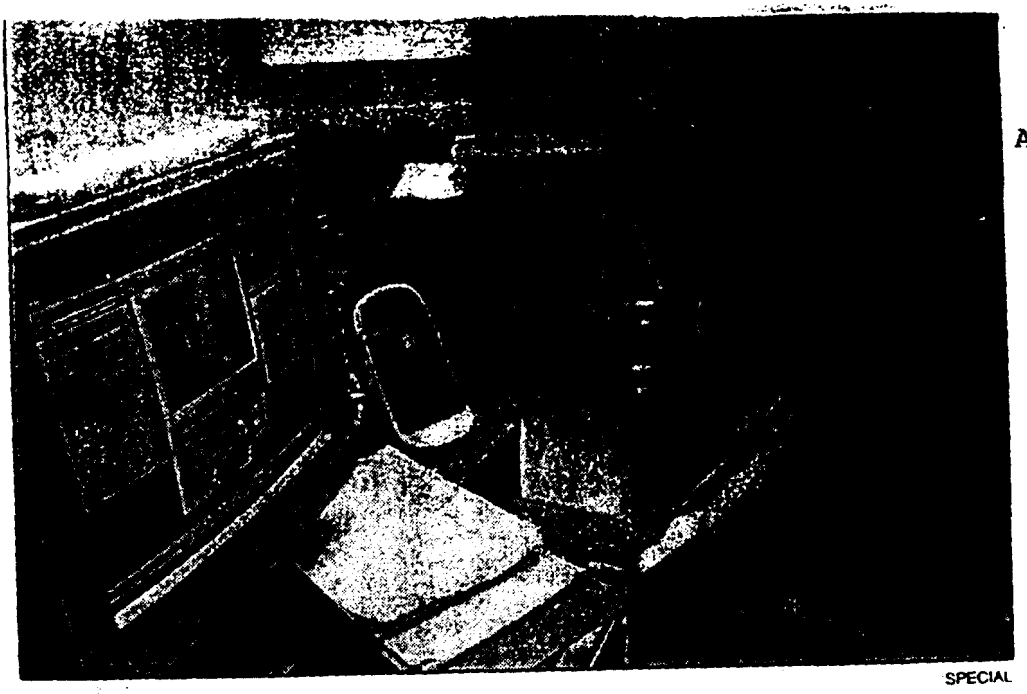


Photo illustration by MARK GILES / Staff

Medical College of Georgia registered nurse Debbie Durham (far left) checks in with patient Mary Culver. The two-way video-conferencing system allows live audiovisual communication and lets patients transmit medical data without

Augusta Chronicle 12/18/1997



SPECIAL

More than 25 Medical College of Georgia patients have been connected to hospital staffers via audio-visual computer stations and cable television lines.

House calls computerized

Cost a concern

By Wayne Partridge
Staff Writer

In the near future, a visit with the doctor could be made from the comfort of your living room lounge chair.

It's already a reality for more than 25 area patients, who have been connected to hospital staffers for nearly a year via audio-visual computer stations and cable television lines.

"Just as you do home shopping, it is now very feasible to do home health care," Francis Tedesco, president of the Medical College of Georgia, said during Wednesday's unveiling of the "electronic house call" system.

MCG has been working with the U.S. Army, Georgia Institute of Technology and Jones Intercable to test the concept, which uses off-the-shelf computer technology to allow a health-care worker and a patient to see and hear each other during an "electronic visit."

During the visits, which can be conducted at a predetermined time or initiated by the patient or hospital staff, the care giver can talk a patient through a series of medical tests, such as blood pressure and heart rate measurements and electrocardiograms.

The system, which in its current form costs about $15,000 per unit and requires access to a coaxial cable, is a modular design, which means other testing instruments can be attached to the home unit and performed remotely.

Researchers say applications for the device are almost limitless. Although initial testing for the concept used primarily elderly and chronically ill patients as subjects, the device can be used by anyone from a worried parent with a coughing child to a soldier on the battlefield.

"Many soldiers, sailors and airmen are stationed in remote areas where there is primary care, but specialty care is limited. This brings the highest level of specialty care to them," said Brig. Gen. Stephen Xenakis, commander of the Eisenhower Army Medical Center.

The U.S. Army paid for nearly half of the $2 million research cost for the project, which researchers say has proved the usefulness of the system.

MCG Beeper 12/18/1996

Electronic House Call Brings Health Care to the Home

TONI BAKER

The prototype for an electronic house call that could make health care as accessible as cable television has been developed and tested collaboratively by two Georgia universities, the U.S. Army and a private cable company.

The prototype, developed by researchers at the Medical College of Georgia and the Georgia Institute of Technology, has been tested in the homes of 25 patients of MCG Hospital and Clinics and Eisenhower Army Medical Center at Fort Gordon. It's also being tested at Westlake Manor, a 100-bed nursing home in Augusta, with links to a physician's office and his home.

The electronic house call targets "frequent flyers:" people whose chronic health problems require constant attention that can lead to frequent doctor visits and hospital stays.

"This system is for people with chronic diseases such as asthma, uncontrolled diabetes or heart failure who require frequent care," said Dr. Max E. Stachura, Clinical Director and Interim Director of the MC Telemedicine Center. "The become frequent flyers wh they can't quite manage th care and they fall off track. That's when they appear in the emergency room. Wha we want to do with this sy tem is help them stay on track and out of the hospit

He considers cable tele sion, which already has a comfortable spot in many homes, an ideal medium

... House Call

"There are going to be multiple services brought into the home by the cable system. You are going to be able to do your banking at home. You are going to be able to get an education at home. You should be able to get health care at home, too," Dr. Stachura said.

Jones Intercable Inc., a Denver-based company which services the Augusta area, provided the unique cable service – which not only brings a signal into the home, but also gets one back out – at no cost to test patients.

Development and initial testing of the electronic house call was funded primarily by a $916,687 grant from the Department of the Army and a $950,000 grant from the Georgia Research Alliance.

Researchers fashioned the electronic house call prototype from existing computer hardware, with additions such as a multi-function patient monitor – like that used in intensive care units – into which blood pressure cuffs, stethoscopes and other medical devices are plugged, said Dr. John Searle, MCG Telemedicine Center's Technical Director. The patient's computer also is fitted with a video-conferencing camera that can be remotely controlled by the nurse.

Georgia Tech's Biomedical Interactive Technology Center developed a system using a touch-screen monitor, said Michael F. Burrow, Senior Research Engineer at the center. For example, a patient touches a telephone icon on the screen to make the initial connection with the nurse practitioner.

The computer system uses a commercially available video-conferencing program enabling the nurse and patient to see each other and interact throughout the examination. The prototype also accepts data from several medical devices, allowing patients to have their blood pressure and blood oxygen levels checked and their temperature and weight measured. The nurse can listen to their heart and lungs and perform an electrocardiogram. Researchers are developing ways to alter the menu of measurements to meet the specific needs of a patient, Dr. Stachura said.

The system provides audio instructions and images on the screen to assist the patient during the exam, Mr. Burrow said. "The system gives the patients instructions on how to use the instruments. If they are not sure about something, they can touch a help icon to obtain more detailed information about using the instrument and the purpose of the test.

"For the most part, the patient feedback has been positive," Mr. Burrow said. "The patients like the idea of being monitored at their homes and interacting with the nurse frequently."

Electronic house call visits vary from daily to several days a week, depending on a patient's need. But patients can use the system more often to check their vital signs, information added to their database which the nurse reviews.

Jones Intercable Inc. provided dedicated cable channels not accessible to the public for use in the project, said George Paschall, Director of Public and Government Relations for Jones Intercable Inc. The company also installed a modem at each patient's home to transmit computer information from a cable line to another computer, enabling communication with MCG Hospital or Eisenhower Army Medical Center. Jones also installed two-way amplifiers throughout the overhead cable system to ensure a strong signal in both directions.

"From our perspective, it's a visionary thing in terms of delivering services to patients at home," said Loretta Schlachta, Clinical Coordinator for Telemedicine for the Department of Defense's Center for Total Access. "(Self-care is) the first level of care. When you get a cold, you are the first one to intervene. (The electronic house) brings the level of care to where it makes the most difference, at home.

The electronic house call also helps identify problems early among nursing home residents to help preclude hospitalization.

"We wanted a system that could help patients take better care of themselves," Dr. Stachura said. "We also wanted one that could help address the very real issue of an aging population, wherever they might live. Now that we know we can do that, the next step is to look at how to make it as unobtrusive as our television set."

Developers at Georgia Tech and MCG are seeking a company to help standardize the technology and make it more commercially viable. "We can

turned into a neat, small p age."

As is, the prototype co about $15,000 for each u and, because the hardwar off the shelf, it has some unnecessary technical cap ities. "I'd like to see a sys that would cost less than $10,000." Mr. Burrow sa and he thinks that's realis

As the technology is f tuned, the researchers als want to further explore th full potential of the electr house call. "We've shown can be used for these par ters: blood pressure, hear lungs sounds, etc.," Dr. Stachura said. "But how

New Horizons in Telemedicine

New Horizons in Telemedicine Technology *Virtual Presence and International Laparoscopy Surgery*

Bruce Ramshaw, M.D.
Department of Surgery
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Atlanta, Georgia

Bruce Ramshaw, M.D.
Iqbal Garcha, M.D.
Edward Mason, M.D.
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Tony Jatcko
Georgia Baptist Medical Center Atlanta, Georgia

The Use Of Telemedicine For Proctoring Surgeons Learning Advanced Laparoscopic Procedures

Introduction

In a short period of time, laparoscopic cholecystectomy has become the preferred method of treatment for the majority of gallbladder pathology. This has been motivated by various forces including pressure from equipment companies, hospitals seeking a potentially lucrative large market, but most importantly, significant improvement in patient outcomes and decreased overall costs when compared to open cholecystectomy. This leap to the future of surgery has not occurred without worrisome problems, however. The concerns over adequate training and appropriate credentialing of an entirely new approach to surgery have been well documented.[1,2,3,4,5,6] Unfortunate increases of common bile duct injuries up to four percent and increased referrals of major biliary injuries due to the laparoscopic technique have been reported.[3] Early attempts at credentialing guidelines have not been universally adopted and poor outcomes have resulted in government intervention to demand certain requirements for credentialing.[1] An editorial by Frederick L. Green, M.D., past president of the Society of American Gastrointestinal Endoscopic Surgeons, addressed this concern, "Unless we act responsibly as individually on our hospital medical staffs and within our professional medical organizations, such as SAGES, and demand that the highest principles be used in credentialing, privileging, and developing competency among ourselves and our colleagues, the state and federal governments will take over this activity for us."[1]

With continued progress in the development of equipment and technology for advanced laparoscopic surgery, the capability to perform these procedures is continually improving. However, the ability to adequately and responsibly train surgeons in advanced laparoscopic techniques has lagged far behind the technical advances of the equipment. The majority of financial and technical resources have been put into development of equipment so that advanced laparoscopic procedures can be done, but little has gone into the training of surgeons so that these procedures can be done safely. These points were emphasized at the conclusion of Dr. Green's editorial, "As advanced laparoscopic surgery continues to develop, it is absolutely essential that the surgical community continue to develop strong educational and credentialing guidelines and work diligently to keep our own house clean."[1] The negative experiences that have been encountered in the evolution of laparoscopic cholecystectomy will be magnified as the advanced, more difficult, laparoscopic procedures become an option in the treatment of a variety of intraabdominal and extraperitoneal pathology.

The current method of training advanced laparoscopic procedures to the number of general surgeons who need to learn these techniques is severely inadequate. Many surgeons pay fees for courses that are made up of observation, lecture and video of a particular procedure. Due to the increased difficulty and longer learning curve of advanced laparoscopic procedures, a one or two day course comprised mainly of observation of a few cases is not

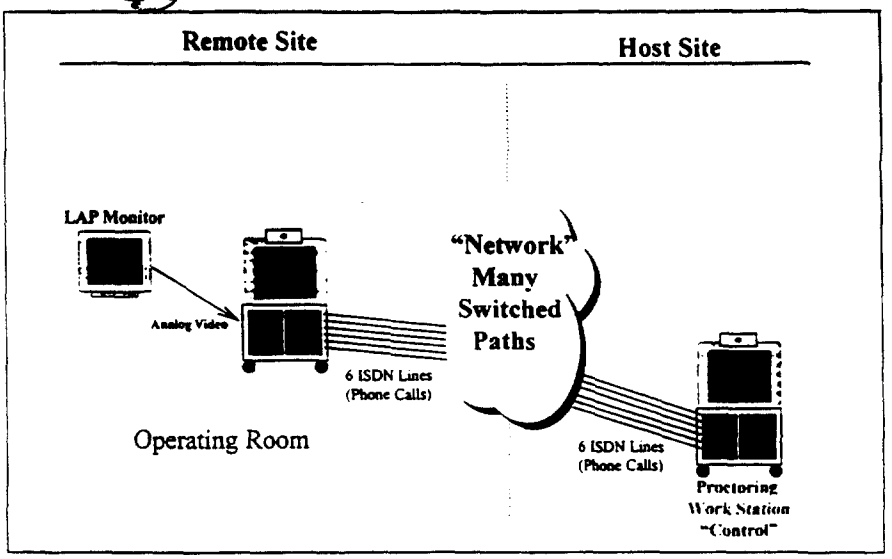

FIGURE 1. IntelliMed's Electronic Proctor

enough. For those fortunate surgeons in an urban setting or with connections to a training center, there is the option to set up proctorships with a laparoscopic instructor. Although this may be the optimal way to ensure adequate training and competence of all surgeons learning advanced laparoscopic procedures, this is not practical.

The purpose of this study was to evaluate a potential solution to this problem using currently available videoconferencing technologies. A cost effective application of Telemedicine was used to provide surgeons in training access to expert laparoscopic surgeons without the expert surgeon actually being present in the operating room.

MATERIALS AND METHODS

Over a three month period, thirty laparoscopic procedures were performed by surgeons in training at one community teaching hospital. Throughout all procedures, an expert laparoscopic surgeon in a conference room in another part of the hospital was watching the exact laparoscopic image that the surgeon in training was operating from. Using ISDN lines with three BRI to provide a 384 kbs band width, the expert laparoscopic surgeon was able to proctor the surgeon in training with a live real time audio, video and data interaction. Using a Panasonic videoconferencing system with a codec optimized to ISDN, this live interaction included a pointing capability to similate the expert laparoscopic surge on actually standing in the operating room, pointing at the monitor *(Figure 1)*.

Five different expert surgeons were used as proctors for a number of surgeons at various levels of their training to evaluate the capability of this technology to assist in the safe adoption of the ability to perform advanced laparoscopic procedures.

RESULTS

The quality of the transmission was judged to be adequate for proctoring by all of the expert laparoscopic laparoscopic expert surgeons. They felt this form of proctoring was equivalent to actually standing in the operating room and pointing to the laparoscopic monitor.

There were no significant complications or deaths in the patients undergoing the thirty procedures where the proctoring via telemedicine was utilized. During many of the procedures, however, there were minor complications such as bile leaks or injury to small blood vessels. These minor complications were managed by the surgeons in training using the interaction with the laparoscopic expert surgeon via telemedicine to assist them.

DISCUSSION

Nothing in medical history has affected the practice of surgery or evolved so rapidly as laparoscopy has in the general surgical community in the last five years. When laparoscopic cholecystectomy was first presented at a national meeting in 1989, initial reviews ranged from very cautious to highly critical and even sarcastic. Now laparoscopic procedures have been established as a safe and effective alternative to open surgery if performed by surgeons well trained in laparoscopic techniques. The added benefits of less pain and scarring and quicker recovery for the patient make the laparoscopic approach preferable for the patient. General Surgeons are paying thousands of dollars to go to one and two day courses to attempt to learn these procedures to provide better care for their patients. Unfortunately, this amount of training alone is inadequate and when surgeons do attempt these procedures on their patients, there is rarely an expert laparoscopic surgeon available to be in the operating room to proctor the surgeon.

In a study to evaluate the relationship between laparoscopic complication rates and surgeon dependent variables following a two day laparo-

scopic training course, two specific variables were identified that increased the rate of complications. At three months, surgeons who performed laparoscopic procedures without additional training were 3.39 times more likely to have at least one complication compared with surgeons who sought additional training. At twelve months, surgeons who attended the training course alone, were in solo practice, or performed laparoscopic surgery with a variable assistant were 4.85, 7.74 and 4.80 times likely, respectively, to have a complication than their counterparts.[7] Based on these results it seems that even a two day training course offering 8 hours of didactic lecture, two live case presentations, 4.5 hours of practicing with laparoscopic simulators, and an additional 4.5 hours in a live animal laboratory was not adequate to lower complication rates when compared to surgeons who sought additional training and surgeons who had an ongoing clinical association with surgeons performing similar procedures.

There is an obvious need to make qualified laparoscopic surgeons available for proctoring or precepting the surgeons first few cases and potentially allowing for a credentialing process.[7,8] The technology that is now available to address this issue is broad bandwidth telecommunications with compression-decompression technologies to allow for live two-way audio, video and data transmission via cost effective fiberoptic telephone lines. It will be practical for trained surgeons to proctor other surgeons for the first few cases until credibility is established without the proctoring surgeon ever having to leave the office. The live two way real time interaction allows one surgeon to effectively proctor and assist another surgeon using audio, video and annotation capabilities. The proctoring surgeon can draw on his annotation pad and the operating surgeon will see the writing on his live laparoscopic monitor.

Precepting and providing assistance to surgeons during their learning curve via telemedicine is a practical way to significantly improve the quality of training advanced laparoscopic surgical procedures using technology that is available today. It approaches the only other adequate form of training that is available, which is a qualified laparoscopic surgeon actually scrubbing in with the surgeon in training until the expert surgeon feels the surgeon in training is qualified. This type of apprenticeship is the basis for our surgical residency programs but it is not practical for the majority of surgeons in practice wanting to learn advanced laparoscopic procedures but unable to leave their practice to return to residency, or for the few experts in advanced laparoscopic procedures unable to scrub in with every surgeon who attends their courses.

This study confirms that technology is currently available to provide access to expert surgeons anywhere in the world for surgeons attempting to learn advanced laparoscopic techniques. The need for improving the quality of training and proctoring these techniques is immediate. Confirmation of the ability of this technology to address this immediate need leads us to the next phase of implementing this Telemedicine application. A general surgeon in private practice by himself in a rural community will be proctored over a three month period on all advanced laparoscopic procedures by expert laparoscopic surgeons at a community hospital based training center over fifty miles away.

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BIOGRAPHY

Bruce Ramshaw, M.D., Instructor of Endosurgery, Director of Telemedicine, Georgia Baptist Medical Center, Medical degree at the University of Florida, Residency training at Georgia Baptist Medical Center in Atlanta. Has trained surgeons in Advanced Endoscopic Surgery around the world including courses in Moscow, Russia and Italy. Has presented at major national and international meetings including the Fourth World Congress of Endoscopic Surgery in Kyoto, Japan. Directed and coordinated the Telemedicine Program for the length of the Goodwill Games linking a hospital in St. Petersburg, Russia to Georgia Baptist Medical Center in Atlanta. This included live laparoscopic surgery performed by surgeons in St. Petersburg, monitored by surgeons in Atlanta. Has also founded Med Ascend, a company dedicated to using currently available technologies to improve the quality of medical training and education.

New Horizons in Telemedicine Technology
Picasso

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INTERACTIVE CONSULT

Portable store-and-forward unit wins out in telemedicine technology trial

BY ELLIE JONES

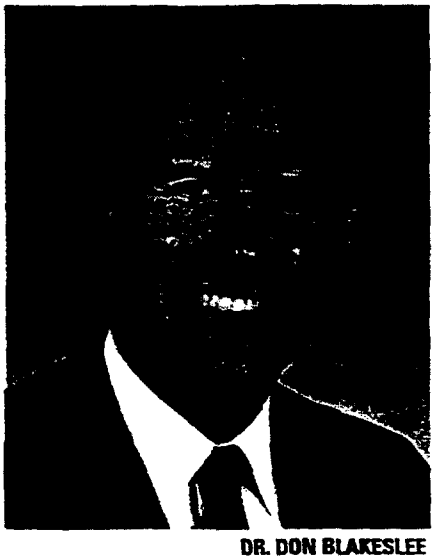
Still-image devices are simple enough that a physician can do system setup alone, in an ER, or at the bedside.

THE KEY TO TELEMEDICINE PRACTICALITY IS equipment that can be easily integrated into the existing practice, according to Dr. Don Blakeslee, a Demorest, GA-based otolaryngologist who has practiced rural specialty medicine for more than 20 years.

To test the practical applications of telemedicine in rural communities, Blakeslee has conducted a year-long field trial with the department of otolaryngology at Emory University. The trial employs three different telemedical technologies and is proving profitable—even in the absence of reimbursement.

Q: *You are using three technologies—the Optel system for store-and-forward transmission between physicians' offices, the Picasso for store-and-forward for transmission between operating rooms and emergency rooms, and a combination of off-the-shelf units for interactive consulting between institutions. For rural physicians thinking of deploying telemedicine, what technology do you recommend?*

A: I would start with the least expensive and the most user-friendly. Something like the Picasso system is wonderful, but an even better place to start is your own computer. By equipping your computer with a scanner, you can take a photo of your patient, or of an x-ray, and transmit it to a trusted consultant. Once e-mail is set up, you have telemedicine at your fingertips and then you can gradually move into other systems.



DR. DON BLAKESLEE

Q: *After using the three technologies for a year, how important do you feel the synchronous consultations are versus the asynchronous?*

A: The asynchronous mode is key for the early success because the physician can do everything alone. The Picasso, for example, is simple enough that I can set it up myself in the operating room, emergency room, or bedside. With the interactive system, we need a technician and a coordinator on our end and the same on the receiving end. The still photos that are transmitted are very simple, very mobile, whereas real-time imaging requires two dedicated administrative staff on each end with a receiving physician, a remote physician, and a patient, who all need to be scheduled—that's the hard part.

Only one of our 46 consultations was live and that is because I would still be waiting to talk to the other physician because he's always busy. Most of the physicians at tertiary care centers are working day and night and do not have an appreciation of what we're trying do. For example, most of the metropolitan hospitals are dividing up the pie as managed care takes over, and are trying to capture the rural market. There's no better way to do that economically than with telemedicine—you do not have to build a facility and your personnel are pretty much limited to the ones I just described.

Q: *With hospitals looking to rural areas, there's a perception among physicians in those regions that the major hospitals are predators that want to use telemedicine to steal the good cases. What do you think of that view?*

A: I think the physician who is experienced and well known in the community will always retain patients. He or she just now has the capability of providing better resources. Tertiary care centers are so busy that if unnecessary consults are eliminated, they will be more efficient, able to render the care in a more timely fashion, and be reimbursed in a manner that is less wasteful. So, no, I don't think the tertiary care

continued on page 41

"Consult" continued from page 42
centers are the predators here, I think they're the benefactors.

Q: *What other benefits do you see resulting from your network?*

A: First, it eliminates what is often the number-one complaint of rural physicians, which is isolation. That's one of the reasons it's hard to keep practitioners in a rural practice, particularly a specialist. With telemedicine I can sit at my desk, turn around and talk on the telephone, and using a monitor, consult with other specialists.

Second, you bring to the community a high quality of care that was not available before.

Another benefit is that telemedicine positions the rural community hospital as a resource—it is usually one of the bigger employers in the area—and it is really important for physicians to be able to use the hospital.

Q: *With telemedicine increasing access to a multitude of specialists, won't the competition drive the few rural specialists away from remote communities?*

A: Actually, the reverse will happen. When you hook up telemedicine networks you will have centers of excellence. There won't be 100 medical schools like now, but maybe 50, and there'll be selected centers for specific problems.

The real fallout, once telemedicine becomes widely available, will not be the smaller communities but the larger medical centers, because you will be able to do more with less people. ■

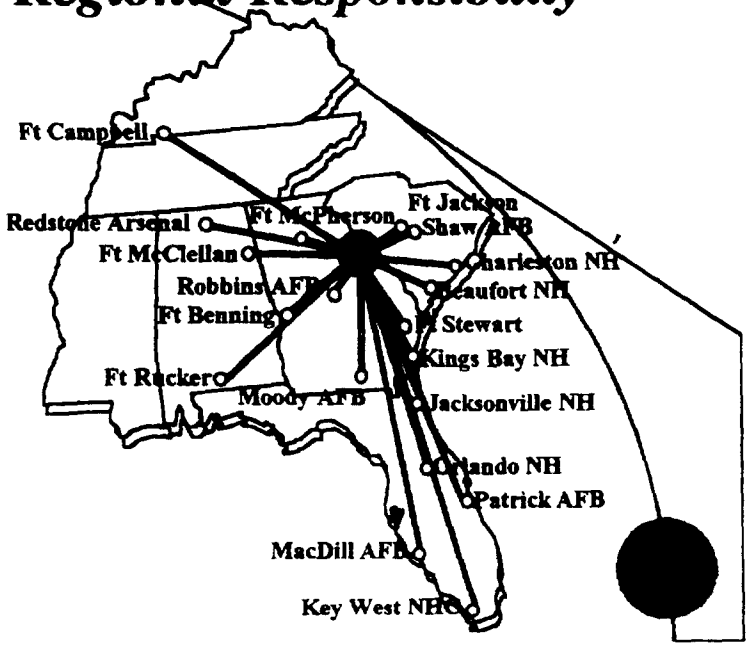
New Horizons in Telemedicine Technology *Connectivity-Isoethernet*

Vincent J. Colwell, M.B.A., M.P.A.
Chief, Technical Branch
Center for Total Access
Fort Gordon, Georgia

Application Approach

- No disruption of daily operations
- Apply most appropriate 'fit'
- Open systems and open standards
- Work with familiar tools - telephone, pager, desk top PC

Regional Responsibility



NATALEE WATERS/S

Kevin Raffloer (left) and Jim Banks, of GEC-Marconi Hazeltine, test the Video in Ambulance system Wednesday at Fort Gordon.

Video links doctors with victims

By Tom Corwin
Staff Writer

The open chest wound fills the television screen as the doctor in the emergency room at Dwight D. Eisenhower Army Medical Center looks on.

But the patient is still miles away as he lies in an ambulance racing toward the hospital. The new experimental video link for the first time is giving the doctor a look at the patient before he arrives at the emergency room, adding critical time to "golden hour" treatment that may determine life or death, officials said. One day it may one day be used to help treat victims of natural disasters or massive plant explosions or provide rural patients a video link to specialists.

"It's the next step" of the telemedicine system, said Vince Colwell, director of the technical branch of the Center for Total Access, which conducted the study.

A roof-mounted camera sends a digitized video signal back to the hospital via a special radio, much like a cellular phone transmits a phone call, Mr. Colwell said. A radio on the other end catches the signal and a special decoder turns it back into a "real-time" or television-quality picture.

Officials at the center demonstrated the new video technology Wednesday using a dummy to simulate the massive chest and head wounds from a bad car wreck. But it's real application would be on the battlefield, when the first hour after being wounded determines survival, Mr. Colwell said.

"We don't have one patient at a time, have multiple patients," Mr. Colwell sa This system would allow the more high trained doctor back at the base to direct t medic and help in deciding which patients a highest priority, he said.

The system cost about $4 million to deve and was a partnership between the center a two companies, who will now market parts the system for commercial use. GEC-Marc Hazeltine of Green Lawn, N.Y., developed special wide-band radio systems needed a will sell them for about $80,000 each, s Richard Wiggins, director of business dev opment. The Harris Corp. of Melbourne, Fl developed the video system and will sell it about $15,000.

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